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ABSTRACT

This study examines the articles from current journal literature in the field of instruction/educational technology to ascertain the number of articles written by women each year and the content that women are addressing in their articles. A previous study of the journal literature (Foley, Gurney, & Branch, 1994) examined women's contributions to the literature from 1988-1992. Both the current and previous analyses used method similar to Ely's work in analyzing the literature of the field (Ely, 1996). This study uses an analysis of the optics of articles to develop themes found in the literature and compares these to the trends and issues identified by Ely (1996) and Molenda, Russell, & Smaldino (1998). Finally, this study takes a critical look at these articles from a feminist perspective in regard to gender issues. (Contains 12 references.) (Author/AEF)

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Women's Contributions to the Leading Journals in Instructional Technology, 1995-2000

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Introduction

This study examines the articles from current journal literature in the field of instructional/educational technology to ascertain the number of articles written by women each year and the content that women are addressing in their articles. A previous study of the journal literature (Foley, Gurney, & Branch, 1994) examined women's contributions to the literature from 1988-1992. Both the current and previous analyses used methods similar to Ely's work in analyzing the literature of the field (Ely, 1996). This study uses an analysis of the topics of articles to develop themes found in the literature and compares these to the trends and issues identified by Ely (1996) and Molenda, Russell, & Smaldino (1998). Finally this study takes a critical look at these articles from a feminist perspective in regard to gender issues.

Rationale

Instructional Technology Research Agenda

A rationale for investigation of women's contributions to the literature in educational/instructional technology comes from several sources. Molenda (1996) describes an agenda for research in the field in order to "determine where the knowledge gaps are..." (p. 38) and calls for an examination of the "adequacy of journals and periodicals" (p. 40) as a means of describing communication within the profession. In addition, Molenda (1996) calls for an examination of external forces that influence the field. Specifically he asks, "What societal forces are affecting the profession? What are the forces that assist or impede the appropriate adoption of technology in education?" (p. 41).

Our personal experiences in higher education and in the field have yielded real concerns about the field of educational technology and specifically instructional design in terms of how/if they incorporate women's perspectives. Most articles, books, and literature in the field that instructional design students are exposed to continue to be written by men from a clearly masculinist perspective. That the field has the potential to change can be evidenced by the introduction of these texts by women (Driscoll, 1994; Driscoll, 1998; Seels & Richey, 1994; & Glasgow, 1990; Smith & Ragan, 1999) used in the foundational courses in the instructional design program at a leading university (personal correspondence, 2001).

A Focus on Women's Contributions

There are valid reasons why a study of the field should include a focus specifically on women's contributions. As is documented in recent statistics, teaching is (still) a female dominated profession. Findings from the 1993-94 survey by the National Center for Education Statistics show that 73% of teachers in public K-12 education and 75% of teachers in private K-12 education are women (National Center for Education Statistics, 2001). Ely also states, "There is an insistence that teachers must become technologically literate" (1996). As noted in both Ely's (1996) and Molenda's (1998) trends, computers are pervasive in education settings and educational technology is seen as a "major vehicle for educational reform" (Ely, 1996). Women, then are potentially prime purveyors of the educational/instructional technology literature as it relates to K-12 education.

Reflections on Previous Studies

The foundational study of women's contributions to the literature (Foley et al., 1994) came out of graduate experience that involved instructional design classes populated predominantly by women students without reference to one female author. At that time it was found that the percentage of articles by women in 11 instructional technology journals ranged from 68% to 20%, with "no discernable patterns [found] within each journal over the five-year period [1988-1992]" (p. 59). An analysis of the content of articles written by women revealed that most articles concerned computers (11%) and computer assisted instruction (5%) and the non-specific category of design and development (8%). Only 2% of all the articles written by women in the same period addressed gender issues. The fact that so few women in the field were not writing about gender raised the question concerning "the experiences of women attempting to publish in the field of instructional technology" (p. 59).

Ely has completed a series of analyses of the publications of the field. Most recently he identified eight trends (1996). Molenda et al. (1998) identified ten key issues from their analysis of the literature of the field. A comparison of Ely's and Molenda's findings, shown in Table 1 below, identifies many similarities and some differences.

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Table 1 Comparison of Ely's Trends and Molenda's Issues in Instructional Technology

Ely (1996)		Molenda et al. (1998)
Computers are pervasive in schools and higher education institutions. Virtually every student in a formal education setting has access to a computer.	⟷	Incorporation of computer-based media into the instructional mainstream.
Networking is one of the fastest growing applications of technology in education.	⟷	Incorporation of telecommunications-based media into the instructional mainstream.
Access to television resources in the school is almost universal.	⟷	Incorporation of traditional audiovisual media into the instructional mainstream.
Advocacy for the use of educational technology has increased among policy groups.	⟷	Acceptance and support of the concept of Educational Technology.
Educational technology is increasingly available in homes and community settings.	⟷	The home as locus of technology-based learning.
New delivery systems for educational technology applications have grown in geometric proportions.	⟷	Application of advanced interactive technologies (multi-media, hypermedia, virtual reality.
Educational technology is perceived as a major vehicle in the movement toward education reform.	⟷	Restructuring/Reengineering of basic organizational processes.
Unique Trends and Issues		
Ely (1996)		Molenda et al. (1998)
There is a new insistence that teachers must become technologically literate.		Updating paradigms and procedures for instructional systems design. Growing interest in learner-centered, inquiry-based instruction. Commitment to increasingly authentic assessment.

Methodology

Research Questions

Two questions guided this study:

1. What percentage of articles are written by women each year in leading educational technology journals?
2. What topics are women writing about in leading educational technology journals?

Journal Selection

Selection of seven journals for inclusion in this analysis were based on Ely's (1999) identification of those publications read by educational technologists. The seven journals included in this analysis are; *British Journal of Educational Technology, Educational Technology, Educational Technology Research and Development, Innovations in Education and Training International, Journal of Research on Computing in Education, Learning and Leading with Technology* (formerly published as *Computing Teacher*), and *TechTrends*. Six of these seven journals are cited as leading educational technology journals for publishing in the field (Price & Maushak, 2000); *Innovations in Education and Training* is not included in the latter list. Analysis was conducted in these journals over a six-year period, 1995-2000.

Quantitative Analysis

The process for descriptive quantitative analysis involved: 1). documenting the number of articles written in each journal; 2). ascertaining which articles were written by women as either first or second author; and 3). determining the percentage of articles that were written by women annually for each journal. Editorials and regularly published columns were not included in this analysis. Selection of inclusion for an article was based on first or second authorship by a woman. While many articles were written by larger groups of people and women's names appeared as authors in the group, ERIC protocol limits two authors in their citations and experience has shown that lead authorship is most often ascertained by order. Because this is a study of the contributions of women in the field we wanted the articles included in this study to reflect a clear leadership role of the women authors, both in terms of content and context of the article.

Determination of gender was based on analysis of the first names of one of the first two authors. Some journals (conveniently) provided pictures of the primary authors or brief biographies that often included a feminine or masculine pronoun. Difficulties arose when authors were identified by first initials only and for those European names that are typically used by either women or men (Robin, Leslie, Lyn, etc). In addition, because neither of the coders were familiar with Asian, Arabic,

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Indian, and some European names, a list of unfamiliar names was distributed to colleagues from these geographic areas for further identification. For those cases, where gender could not be determined for first or second author, the article was eliminated from analysis in this study.

Content Analysis

This study employed a content analysis methodology based on Ely's (1996) and Foley's et al. (1994) previous studies. The process of content analysis involved: 1). identifying the total number of articles each year, excluding regularly published columns and editorials; 2). ascertaining the number of articles written by women as either first or second author; 3). describing the content of the article by two coders; and 4). negotiating final category placement through a dialogic process. Both coders, authors of this article, are experienced instructional designers. Coders examined each article authored by women and identified a category that best described the focus of the article. Whenever possible coders used the author's words to assign a content category. In cases where different words described the same thing, (i.e. computer assisted instruction/ computer based instruction) one category was created for both (computer assisted instruction). After independent coding, coders negotiated differences in selection of category, making a case for one or the other or collaboratively choosing an alternate category that satisfied both coders.

One difficulty in determining category arose when addressing process/product over context. Articles describing the use of technology or computers in special education were placed in the category of Education K-12. Finally, because the purpose of this study was to determine if women are writing about women's issues in the field, gender was a primary category regardless of context. Because negotiation was an essential part of the process, analysis had to be conducted in a timely fashion. Articles had to be independently coded and discussed within a short working period so that coders could remain familiar with the content of each article during negotiations.

Findings

What percentage of articles are written by women each year in leading educational technology journals?

A total of 1809 articles were published from 1995-2000 in the seven journals included in this study. Of these, 993 articles were written by women as first or second author. The percentages found in Table 2 below reflect annual averages for each of the journals included in the study. The percentages of articles written by women range from a low of 33% to a high of 74%. An analysis of the percentages shows no discernable trends, increases/decreases from year to year. Three journals (*Educational Technology Research and Development, Journal of Research on Computing in Education, and Learning and Leading with Technology*) consistently had an annual average of 50% or more articles written by women; one journal (*Educational Technology*) had an average of less than50% of articles written by women over the 6-year period. It should be noted that two of these journals are published internationally, although no differences were reflected in their annual percentages from those published in the US. All of the journals except one had a research focus; *Learning and Leading with Technology*, the exception, is a K-12 education practitioner oriented journal. Given the predominance of female teachers in public and private schools (NCES, 2001), no doubt affects the predominance of women authors in this journal. This journal was unique in another feature – it published over 600 articles in the 6-year period of this study, nearly one-third of the total number of articles. Of these 295 were in the category of curriculum development. It was felt that this inordinate number of articles in one category from one journal would skew the findings and so this number was not used in the analysis of content, but was included in the quantitative calculations of percentages of articles written by women. Clearly there is a difference between research and practitioner based journals both in terms of quantity of articles published and in the gender of the primary authors as shown in the figures below.

Table 2 Percentage of Articles Written by Women, 1995-2000

Journal Title	1995	1996	1997	1998	1999	2000	Means
Learning and Leading with Technology	54%	50%	69%	74%	74%	66%	64%
Journal of Research on Computing in Education	62%	50%	73%	63%	64%	50%	60%
TechTrends	42%	55%	55%	41%	71%	59%	54%
Educational Technology Research and Development	52%	53%	56%	50%	55%	50%	53%
Innovations in Education and Training International	54%	45%	45%	49%	63%	63%	53%
British Journal of Educational Technology	50%	47%	39%	58%	48%	69%	52%
Educational Technology	39%	37%	46%	33%	34%	40%	38%

What topics are women writing about in leading educational technology journals?

An examination of the content analysis was done on two levels. Categories were sequenced by the number of articles found in each category. From the perspective of individual categories there were nine content categories most frequently cited in Table 3 below.

Table 3 Most Frequent Topics of Articles Written by Women

Content Category	Frequency
Distance Education	49
World Wide Web – Internet	40
Instructional Strategies	35
Multimedia	35
Integration of Technology in Education	32
Effects of Technology (in any context)	30
Teacher Education	29
Computer Software	27
Professional Development	26

Further analysis clustered individual categories together into the themes found in Table 4. As can be seen by this table, a quarter of the articles written by women in this study addressed technology, with a focus on uses of the World Wide Web and the Internet. Nearly a quarter of the articles addressed instructional delivery systems, with the greatest focus in this theme describing the delivery of distance education. Education/training was also a frequently cited theme and included pre-service teacher education and in-service professional development in both education and business contexts. The theme of design, development, and evaluation spanned the gamut of tasks these processes describe with no concentration in any one area. Interestingly, society, the theme that included gender, multicultural, and minority issues, was not addressed in many of the articles written by women in these journals.

Table 4 Themes and Percentages of Total Articles Written by Women

Themes	Percentages
Technology – Internet, Media, and Computer Software	25%
Instructional Delivery Systems	24%
Education and Training	15%
Design, Development, and Evaluation	10%
Society	8%
Learners and Learning	5%
Utilization Processes	4%
Research and Theory	3.7%
The Field	3%
Management	1.4%

Comparison of Findings

The themes described for this study can be compared with those of Ely (1996) and Molenda et al. (1998) found in Table 1 previously cited in this article. In concurrence with these recent studies, this study found that computers and technology are clearly the most frequently addressed topics by women writing in the field. Technology is addressed on several levels: development (software, multimedia), implementation (distance education and instructional strategies), and preparation (teacher education, continuing education, and professional development). This makes intuitive sense, as technology addresses the main focus of research in the field. More specifically, women also wrote about computer networking and applications of technology, the World Wide Web and the Internet, telecommunications, multimedia, and hypermedia. In addition, much of the content of the literature in this study focused on the uses of technology to deliver instruction, specifically in the development of distance education as a means to effectively reach a wider audience of learners.

As Ely (1996) found in his study, women are writing about the need for more training and education in the use of technology, as evidenced by the numbers of articles on professional development, teacher education, and continuing education. Many of the articles in this study addressed the integration of technology in classrooms and curriculum, specifically computer assisted/computer based instruction and web-based instruction and the use of expert systems. Similar to Molenda's et al. findings (1998), the women in this study addressed how best to instruct students, with a focus on authentic, learner-centered activities, instructional strategies that support active and interactive learning and problem solving. Women in this study addressed the integration of technology in education and the effects of technology as a way of moving education reform and meeting current needs for meeting teaching and learning standards.

Contrary to Molenda's findings (1998), articles in this study rarely addressed policy or advocacy in the use of technology nor did they write about management issues. An examination of the roles of women in the field might explain this lack of focus. How many women are in management and administrative positions where policy is addressed? The women in this study rarely cited instructional systems design (ISD), or research paradigms, methodology, or theory. Are women's articles more practitioner

focused than others? How does this lack of articles reflect the discriminatory notion that women are not suited to abstract thinking? This study revealed no articles addressing the role of computers or technology in homes or communities. Is this a counter reaction to women's traditional place in the home and community and outside of the professional technological arena? Unlike Molenda's findings, there was no strong focus on authentic assessment, although there were articles that addressed assessment in general.

There were several surprising omissions found in the content analysis of these articles. Unlike Ely's and Molenda's previous studies the articles analyzed here did not address the more traditional audio/visual media. The articles included in this study tended to describe technology with an uncritical gaze, without reflection on theoretical frameworks or critiques. Finally, given the statements of concern voiced by many feminists as to the gender inequity in the field, this was not a concern that was addressed by many of the authors in this study (11 articles, 1.5%). Comparing this figure to previous findings of 2% (Foley et al., 1994), there is no real change and in fact a slight decrease in the percentage of articles regarding gender issues. Yet others (Bryson & de Castell,1995; Damarin,1994; Henderson,1996; Knupfer,1997) are writing about gender bias and the design and applications of technology, indicating the issues are not resolved in the field. The omission of gender issues in the literature points to a gap of knowledge that needs to be addressed more frequently. While in general gender issues are seen to be part of women's domain of concerns, women in the educational/instructional technology show slight interest in developing our awareness of these issues in the field.

Conclusion

Nearly all of the journals cited in this study had annual percentages of 50% or more articles written by women. This marks great improvement over past studies and recognizes women's contributions to the field. However, it should be noted that despite these aggregated annual statistics there were individual issues of journals that contained no contributions by women. There were some similarities between the topics of articles described by Ely and Molenda et al., however there were some striking differences. A curious ancillary finding of this study is that only 1.5% of articles written by women addressed gender issues and technology. This finding correlates to the previous study by Foley et al. (1994) where 2% of the articles written by women addressed gender. Questions arise as to why this is not a more pervasive theme of women's contributions to the literature.

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